

Description of two new *Jaspidiconus* species from Bahia State, Brazil

Olivier Crabos ¹, Geraldo Semer Pomponet Oliveira ², Laudelino Passos de Almeida ³,
and Gregorio Pereira de Queiroz ⁴

¹ Rua Juiz Orlando Heleno de Mello 119, Piatã, 41650-465 Salvador, Bahia, Brazil
contact corresponding author at: ocrabos@bioline-group.com

² R Arquimedes Gonçalves 62/501, Jardim Baiano, 40050-300 Salvador, Bahia, Brazil

³ Condomínio Veredas Piatã, Rua C casa 19, Piatã,
41650-010 Salvador, Bahia, Brazil

⁴ Alameda Casa Branca 1204 ap 4, 01408-000 São Paulo, SP, Brazil

ABSTRACT Two new *Jaspidiconus* species from Bahia State, Brazil are described here and compared to other similar taxa from the Brazilian Molluscan Province. A new taxon, *Jaspidiconus vanini* n. sp., is described from Bahia and Espírito Santo States, Brazil and compared to the similar *Jaspidiconus simonei* Petuch & Myers, 2014 and *Jaspidiconus poremskii* Petuch & Myers, 2014. Another new taxon, *Jaspidiconus tinharensis* n. sp., is described from Morro de São Paulo, Bahia State, Brazil and is compared to the similar *Jaspidiconus simonei* Petuch & Myers, 2014, *Jaspidiconus marinae* Petuch & Myers, 2014, *Jaspidiconus ogum* Petuch & Myers, 2014, and *Jaspidiconus icapui* Petuch & Berschauer, 2018.

KEY WORDS Conidae, Brazilian Molluscan Province, Bahia State, *Jaspidiconus*, *Jaspidiconus vanini*, *Jaspidiconus tinharensis*

INTRODUCTION

This paper is dedicated to both our friend and mentor Dr. Sergio Vanin, entomologist at Institute of Biology of University São Paulo USP (see Figure 1), who died on 21 October 2020, and to his wife Dr. Ana Maria Pires-Vanin, oceanographer at Oceanic Institute from USP. Over the years, Dr. Sergio Vanin gave many excellent presentations at the meetings of the Brazilian Shell Club “Conquiliologista do Brasil” with important information on taxonomy and systematic of molluscs. We follow the lead of our mentor Dr. Vanin in describing only new species, which we trust to be distinguishable from existing taxa.

Taxonomically we follow Petuch (2004), Tucker & Tenorio (2013), and Monnier, *et al.* (2018) and use the genus *Jaspidiconus* Petuch, 2004 rather than *Conasprella* Thiele, 1929, as

proposed by Puillandre, *et al.* (2015). This approach is more logical as biogeographically and evolutionarily *Conasprella* species evolved in the Indo Pacific, and *Jaspidiconus* is a paleontologically recent genus, which evolved from *Ximeniconus* in the Carolinean and Caribbean Provinces (Monnier, *et al.*, 2018).



Figure 1. Dr. Sergio Vanin.



Figure 2. Corumbau Beach,

It is important to note that the Conidae Fleming, 1822 is a very diverse family, and that with exploration and discovery the number of Brazilian conid species has increased every year. One explanation for this fact is that in the early stages of development most of the *Jaspidiconus* Petuch, 2004 species have lechithotrophic benthic development, (*i.e.* they are direct developers with no planktonic larval stage and therefore have a limited dispersal abilities (Petuch & Myers, 2014; Berschauer, 2015)). Accordingly, most taxa in the the genus have quite restricted habitats and there is significant endemism. The Abrolhos Platform and reef has only recently begun to be studied and its molluscan biodiversity still virtually unknown. However, recent preliminary studies have indicated that the platform has unusually high levels of both species-richness and endemism, especially in the family Conidae (Petuch, 2013; Petuch and Berschauer, 2018; Petuch, Coltro & Berschauer, 2020). Based on our field observations, we find the territory of some species appears to be more extended than what was originally understood (*Jaspidiconus ogum* Petuch & Myers, 2014 and *J. marinae* Petuch & Myers, 2014 for instance), whereas other species still seem to be present in a very restricted locality - such as *J. itapua* Petuch & Berschauer, 2016, which is only known from Itapuã beach.

The new species described herein are: *Jaspidiconus vanini* n. sp. from Corumbau (Bahia) (Figure 2) to Guarapari (Espírito Santo), which is distinct from *J. simonei* Petuch & Myers, 2014 and *J. poremskii* Petuch & Myers, 2014; and, *Jaspidiconus tinharensis* n. sp. from Morro de São Paulo and Barra Grande, which is distinct from *J. marinae* Petuch & Myers, 2014, *J. simonei* Petuch & Myers, 2014, *J. ogum* Petuch & Myers, 2014, and *J. icapui* Petuch & Berschauer, 2018. Both of these two new cone

species are found in Bahia State, northeast Brazil.

MATERIALS AND METHODS

We describe the shell morphology using the terminology established in Röckel, *et al.* (1995) and modified in Monnier, *et al.* (2018). Adult specimens were measured using digital calipers; measurements were rounded to the millimeter except for holotypes. The holotypes will be deposited at the MZSP with the following type numbers: *Jaspidiconus vanini* MZSP152459, and *Jaspidiconus tinharensis* MZSP152461.

ABBREVIATIONS

MZSP: Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil

MOECR : Museu Oceanográfico Eliezer Rios de Carvalho, Rio Grande RS, Brazil

UNICAMP, Campinas, São Paulo State, Brazil

OC: Olivier Crabos reference collection, Salvador, Bahia, Brazil

GO: Geraldo Semer Pomponet Oliveira, reference collection, Salvador, Bahia, Brazil

LA: Laudelino Passos de Almeida, reference collection, Salvador, Bahia, Brazil

GQ: Gregorio Pereira de Queiroz, reference collection, São Paulo, São Paulo State, Brazil

SYSTEMATICS

Class	:	Gastropoda
Subclass	:	Sorbeoconcha
Order	:	Prosobranchia
Infraorder	:	Neogastropoda
Superfamily	:	Conoidea
Family	:	Conidae
Subfamily	:	Conilithinae
Genus		<i>Jaspidiconus</i> Petuch, 2004

Jaspidiconus vanini, Crabos, Oliveira,
Almeida, & Queiroz, new species
(Plate 1, Figures A-I)

Description. Shell of medium size from 20 to 26 mm in length, rather slender (approximately half as broad as long), coloured from orange to brown, spire with a white zone on its inferior part, base colour pale orange or pale brown covered with darker patches, 16 to 20 beads visible on the body whorl, coloration alternates white and orange or brown, straight sides, smooth shoulder, orange or brown marks alternating with white, protoconch pale pink to white, aperture pale orange to pale brown.

Type Material. Holotype and 4 paratypes. The holotype is deposited in the Museu de Zoologia da Universidade de São Paulo, Brazil under the number MZSP152459, the paratypes are in private collections. Material examined: 5 specimens of *Jaspidiconus vanini* sp. nov. have been examined. The holotype measures 26.7 mm in length by 12.5 mm in width (Plate 1, Figures A, B). Paratype 1 measures 21 mm in length (Plate 1, Figures C, D, and protoconch view = I), paratype 2 measures 20 mm in length (Plate 1, Figures E, F), paratype 3 measures 26 mm in length (not illustrated), paratype 4 measures 19 mm in length and was collected in Trancoso, Bahia State, Brazil (Plate 1, Figures G, H). Paratypes 1 and 2 are in the private collection of Olivier Crabos; paratype 3 is in the collection of Geraldo Semer Pomponet Oliveira; paratype 4 is in the collection of Fabiano Ramos.

Locality. A live specimen of *Jaspidiconus vanini* was first found on a large region, from Morro de São Paulo on Tinharé Island South of Salvador to Guarapari, Espirito Santo. Paratype 2 was found alive at low tide in Corumbau (See Figure 2), the other specimens were dead collected. All specimens were collected between 0 and 1.5 meter deep. The holotype was found

at Guarapari region, Espirito Santo, at 1.5 m deep on sand. Paratype 1 from Corumbau BA, paratype 2 was found at Alcobaça, Bahia State, and paratype 3 was found at Morro de São Paulo, Bahia State. (Figure 3)

Discussion. Initially we had identified this species as *J. poremskii* due to the location where it was first found (as Corumbau is the type location of *J. poremskii*) and its orange colour, but the average size of *J. poremskii* is 15 mm whereas *J. vanini* varies from 20 to 26 mm, and does not have nodules on the shoulder, which are present on *J. poremskii* (Plate 1, Figures J, K). *J. vanini* also compares to *Jaspidiconus simonei*, but *J. simonei* is mostly dark brown to dark purple coloured and does not carry orange tones (Plate 2, Figures J, K). The background colour of *J. simonei* is white, grey or brown grey, whereas the background on *J. vanini* is pale orange.

Etymology. This species is dedicated to our friend and mentor Dr. Sergio Vanin, entomologist at Institute of Biology of University São Paulo USP, who died on 21 October 2020 and to his wife Dr. Ana Maria Pires-Vanin, oceanographer at Oceanic Institute from USP.



Figure 3. Morro de São Paulo Beach.

Jaspidiconus tinharensis, Crabos, Oliveira,
Almeida, & Queiroz, new species
(Plate 2, Figures A-F)

Description. Shell of medium size from 17 to 24 mm in length, rather slender (approximately half as broad as long), coloured dark brown with many thin black lines and small white patches, spire dark brown colour, base colour black covered with white patches, 19 to 23 beads visible on the body whorl, straight sides, shoulder smooth, orange or brown marks alternating with white, protoconch pale brown, aperture dark gray to dark brown.

Type Material. The holotype measures length 20.6 mm in length by 9.9 mm in width. The holotype is deposited in the Museu de Zoologia da Universidade de São Paulo, Brazil under the number MZSP152461, and is from Morro de São Paulo (Plate 2, Figures A, B, and protoconch view = F). Paratype 1 measures 20.9 mm in length and is at MNHN (Plate 2, Figures C, D); paratype 2 measures 20.7 mm in length and is at MOECR (Plate 2, Figure E); paratype 3 (not illustrated) measures 17.9 mm in length and is at UNICAMP; paratypes 4 through 8 (not illustrated) measure 21.4 mm, 22.7 mm, 22.9 mm, 23.0 mm and 23.6 mm in length and are housed in the research collection of Geraldo Semer Pomponet Oliveira, all from the same locality as the holotype. Paratype 9 measures 22.5 mm in length and is in the research collection of Laudelino Almeida, found in Barra Grande, Camamu Bay, Bahia State, Brazil.

Locality. Collected by Geraldo Semer Pomponet Oliveira in sand in tide pools at low tide, Morro de São Paulo, Tinharé Island, Bahia State, Brazil (See Figure 3). Also collected by Laudelino Almeida in Barra Grande, Camamu Bay, Bahia State, Brazil.

Range. The new species is known to range only along the coastlines from Tinharé Island to Camamu Bay, Bahia State, Brazil.

Discussion. *Jaspidiconus tinharensis* is darker than *J. marinae* (Plate 2, Figures G, H, and protoconch view = I), its spiral sutures are neater and deeper than *J. marinae*, and the superficial aspect is dull whereas the shell of *J. marinae* is porcellaneous, and its protoconch coloured in red or brown and is consistently darker than the protoconch of *J. marinae*. Further, *J. tinharensis* lives on a different island 80 kms south of Itaparica. *Jaspidiconus tinharensis* has a more slender body shape compared to *J. ogum*, a darker colour and does not have granules like *J. ogum* (Plate 2, Figure L). *Jaspidiconus tinharensis* is slim compared to *J. simonei*, smaller overall, has a taller spire and its body whorl is longer than *J. simonei* and is found at 800 kms distance from Guarapari (Espírito Santo) where *J. simonei* is found. Finally, the shell shape of *Jaspidiconus tinharensis* is substantially taller than *J. icapui*, has a slim shape and lives more than 1100 kms from Icapui (Ceara) where *J. icapui* is found.

Etymology. The taxon is named for Tinharé Island, where it was discovered. Tinharé Island is an important island for study of mollusks in the Bahia State, Brazil.

CONCLUSIONS

There are still many undescribed Conidae from Brazil, the richest fauna being those from Bahia and Espírito Santo. Mauricio Andrade Lima has brought to our attention new species of cones from Pernambuco/Rio Grande do Norte/Ceara, which still need to be described. The limiting factor for the moment is that many different new species have been found with only one specimen, and very few specimens have been found alive to allow DNA tests that may be

desirable to further understand these new species. We miss our friend Sergio Vanin's support, advice, and friendship. In conclusion, in an Alexandre Dumas style (we call ourselves the 4 musketeers): "Un pour tous, tous pour un" which means One for all, all for one in French language.

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LITERATURE CITED

- Berschauer, D.P. 2015.** A comparison of adaptive radiation in Conidae and Conilithidae (Gastropoda: Conoidea) in the Eastern and Western Atlantic, together with an iconography of the conilithid genus *Jaspidiconus*. *The Festivus* 47(2):99-113.
- Monnier, E., L. Limpalaër, A. Robin, and C. Roux. 2018.** A Taxonomic Iconography of the Living Conidae. ConchBooks, Harxheim, Germany. pp. 1208 (2 volumes).
- Petuch, E.J. 2004.** Cenozoic Seas: The View from Eastern North America. CRC Press, Boca Raton, London, New York. 308 pp.
- Petuch, E.J. 2013.** Biogeography and Biodiversity of Western Atlantic Mollusks. CRC Press, Boca Raton, New York, London. 234 pp.
- Petuch, E.J. and D.P. Berschauer. 2018.** Ten New Cone Shells form Indonesia, the Marquesas Islands, Brazil, and Pacific Panama. *The Festivus* 50(1):17-32.
- Petuch, E.J., J. Coltro, Jr., and D.P. Berschauer. 2020.** The Cone Shells (Gastropoda: Conidae) of the Abrolhos Platform, Brazil, with the Description of Three New Species. *The Festivus* 52(3):224-232.
- Petuch, E.J. and R.F. Myers. 2014.** Additions to the cone shell faunas (Conidae and Conilithidae) of the Cearaian and Bahian subprovinces, Brazilian molluscan province. *Xenophora Taxonomy* 4:30-39.
- Puillandre N., T.F. Duda, C. Meyer, B.M. Olivera, P. Bouchet. 2015.** One, four or 100 genera? A new classification of the cone snails. *J Molluscan Stud.* 2015 Feb;81(1):1-23. doi: 10.1093/mollus/eyu055. Epub 2014 Sep 5. PMID: 26300576; PMCID: PMC4541476.
- Röckel D., W. Korn, & A.J. Kohn. 1995.** Manual of the Living Conidae. Vol. I, Indo-Pacific. Christa Hemmen. Verlag. Wiesbaden, Germany. 517 pp.
- Tucker, J.K., and M.J. Tenorio. 2013.** Illustrated Catalog of the Living Cone Shells. MdM Publishing. ISBN 978-0-9847140-2-5.

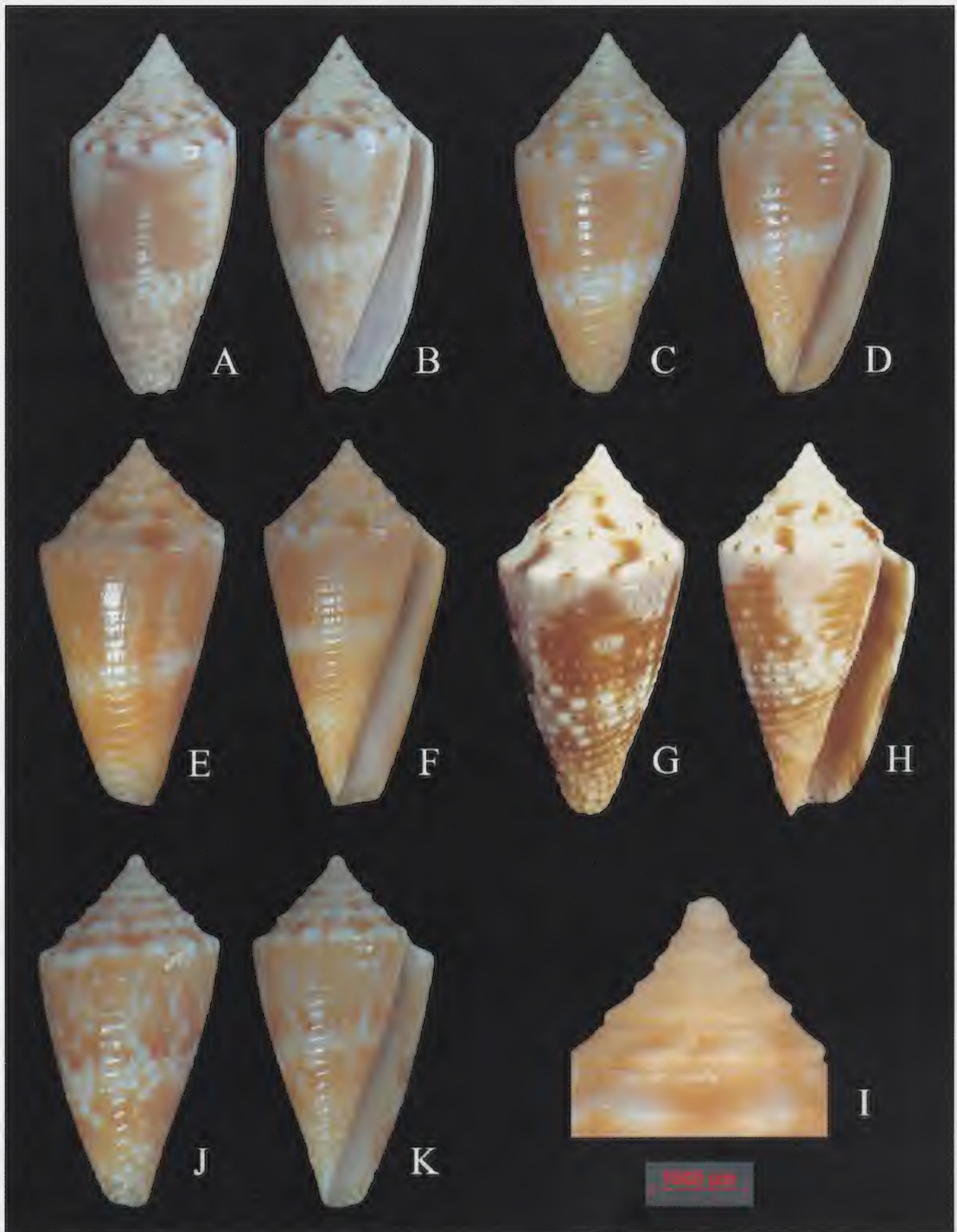


Plate 1. *Jaspidiconus vanini*, Crabos, Oliveira, Almeida, & Queiroz, new species, A-B = Holotype measuring 26.7 mm in length, C-D = Paratype 1 measuring 21 mm in length (I = protoconch view), E-F = Paratype 2 measuring 20 mm in length, G-H = Paratype 4 measures 19 mm in length; J-K = *J. poremskii* specimen for comparison, measuring 15 mm in length.

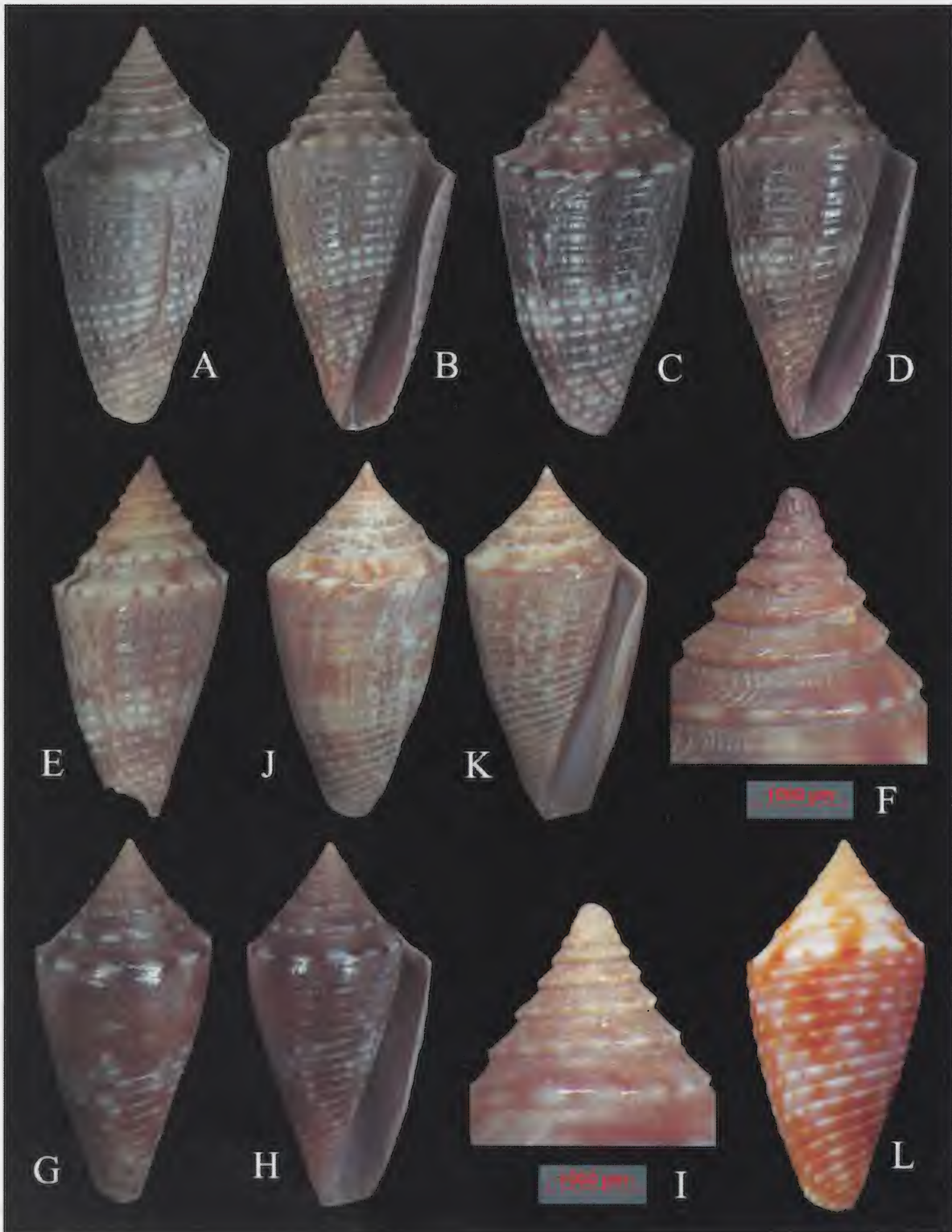


Plate 2. *Jaspidiconus tinharensis*, Crabos, Oliveira, Almeida, & Queiroz, new species, **A-B** = Holotype measuring length 20.6 mm in length (**F** = protoconch view), **C-D** = Paratype 1 measuring 20.9 mm in length, **E** = Paratype 2 measuring 20.7 mm in length; **G-H** = *J. marinae* measuring 21 mm in length (**I** = protoconch view); **J-K** = *J. simonei* measuring 23 mm in length; **L** = *J. ogum*, holotype measuring 15 mm in length, image from original article (used with permission).